ON

ILLUSIONS OF THE SENSES.

BY

ROBERT PATERSON, M.D., F.R.C.P.E., F.A.S.S.,

ETC., ETC.

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ILLUSIONS OF THE SENSES.

Introduction.—Illusions of the senses may *in general terms* be described as false impressions having their origin in the brain, and referred to the different organs of sense.

These impressions are often very distinct and accurate, exceeding in outline and form the most vivid dream, and are seen, felt, or heard, with so many of the circumstances of reality about them, as to give a temporary belief in their existence.

Individuals unacquainted with phenomena of this kind, and to whom they occur for the first time, put them down to one of two sources; to some derangement of the mind, or to supernatural agency. But as such phenomena are of frequent occurrence, startling even to those acquainted with them, it becomes of the greatest importance, in the interests of science, to investigate the causes of such, to explain if possible how they occur, to show by what means they are produced, to tell of the pathological conditions most liable to give rise to them, and to describe the tests to be applied to distinguish illusions from realities.

There can be little doubt that the general impression to which appearances of this kind give rise, had reference to the idea that the spirits of the departed hovered round the living. This idea or belief had its origin in that sublime hope of immortality which has its foundation in the highest and profoundest instincts of the human mind, and which may be called the chief solace and greatest triumph of man's reason. Tribes have been found who had no idea of a Creator, but no people, however rude or debased, have yet been met with who did not anticipate a future state. "Some more or less defined idea of a retributive future," says Dr Wilson, "is found in the wildest savage creed, developing itself in the rude

virtue to which the barbarian aspires. While the luxurious Asiatic dreams of the sensual joys of his Mohammedan elysium, the Red Indian warrior looks forward to the range of ampler hunting grounds, and the enjoyment of unfailing victory in the war path."[1] The Esquimaux[2] and the Arab—the one inhabiting the extreme north, and clothed to suit his icy dwelling; the other, oppressed with the burning sun reflected from Arabian sands—alike breathe the sweet influence of a belief in the immortality of the soul, and people space with the spirits of their departed relatives and friends.

All the anticipations, however, of savage nations are of tangible joys; and, to the simple mind of the untutored savage, affection dictates the provision of means, to supply the first requisites of this state of being.

The burial practices of all nations throw much light on their belief in a future state. This may especially be remarked of the nations of antiquity, whose written records throw little light on this point.

That the habits, duties, and social distinctions of earth would be perpetuated in a future state, was, and is the crude conception of the unlettered mind. Accordingly, the bow and spear,[3] and other implements of the chase, have been very commonly found interred with the bodies of the early hunters. The sword and shield, laid beside the cinerary urn, told of a similar purpose. So we find that many nations also interred with their dead the food which was to serve them in their journey to the other world. The Chinese continue to do so to the present day, putting tea and sweetmeats into the coffin with the departed. The ancient Peruvians did the same; the Siamese also. But it was not only the weapons of the chase and of war which they were to use in another world, or the food which was to serve them on the journey, but wives, concubines, and children, slaves and domestic pets, were often cruelly interred alive with their dead master, for the purpose of being

[1] Wilson's Prehistoric Annals, p. 42.

[2] The Esquimaux have a straightforward account of a future state in which all believe and none vary. "The souls in their happy state inhabit a land beyond the mountains where eternal summer prevails, the sun never sets, ice and snow are unknown, and the fish and whales are plenty for those who wish to catch them."—Lyon's Private Journal, pp. 373–4.

[3] The Esquimaux place the weapons of the chase and useful utensils near the graves of the departed, so that they may be used in the other world. (Lyon's Private Journal, p. 374.) Many early British cysts exhibit the same thing. In Guinea (Picard, p. 791; Madden's Shrines, vol. i. p. 280), when the king or any principal person dies, they murder women, maids, boys, and slaves, to accompany the deceased in his journey to the other world. The bodies of these his new attendants are buried with him, and their heads are stuck upon poles all around his mausoleum at Loango. The decease of a grandee is characterized by much more extravagance than occurs in most other nations. They inter the dead with valuable effects, foreign commodities, domestics, and several young ladies for his amusement in his journey to the other world, and who are buried alive with him.

with him and assisting him in the world of spirits. In India, to this day, pitchers full of water are hung upon the trees adjacent to a grave or place of sepulture, for satisfying the supposed thirst of the dead; and in Etruria, Sir W. Hamilton refers to a similar custom having existed in the burial of their dead.

The ancient Greeks, in laying out their dead, always placed an obolus or Greek coin in the mouth to pay Charon's fare across the rivers Styx and Acheron, and a cake made of flour and honey to appease Cerberus.

The Romans bore their dead with much lamentation to the funeral pile, on which, after being lighted, they cast the robes and arms of the deceased, as well as the slaughtered bodies of his favourite animals.[1]

The Laplanders believe, that the soul of the departed hovers around his corpse; and when they inter him in the woods, they always place a flint and steel beside him, so that he may strike a light to guide him through the thick forests, till he reaches the other world.[2]

The practices of the early nations of antiquity, as stated by the prophet Ezekiel, and corroborated by Herodotus,[3] who lived but a short time afterwards, in the interment of their dead warriors and kings, are strangely coincident with the practices which still exist among the Indian tribes in the burial of their chiefs, especially as described by Dr Daniel Wilson;[4] but all bear an unmistakable

[1] Madden's Sepulchres, vol. i. p. 457.

[2] *Ibid.*, vol. i. p. 362; also Picard.

[3] In the thirty-second chapter of Ezekiel are some remarkable verses illustrative of the practice of barrow burial in the times of the prophet and of Herodotus. The people of whom Ezekiel speaks are supposed to have been situated to the northward of the Euxine and Caspian Seas; and Herodotus describes the barrow burial of the Scythians in similar terms, which are thoroughly explanatory of the passages in Ezekiel: When one of the kings died, his corpse, embalmed and covered with wax, was conveyed in a chariot in solemn state to the place of sepulture; a large quadrangular pit was dug; in this they placed the royal corpse on a mattress of straw; on each side of this they planted spears, and covered it with wood, and roofed it over with hurdles of willow. In the remaining part of the pit they interred one of the late king's women, strangled for the purpose, together with his cupbearer, his cook, his groom, his minister, his courier, his horses, as well as some articles of every kind—including several goblets of gold—that he might be supposed to need in his journey to the other world. This done, the people eagerly contended with each other in the work of heaping over the whole a mound of earth as vast as possible. The proceedings did not here terminate; for, the year following, fifty of the late king's confidential attendants and fifty of his horses were slain, and placed, the men on the horses, around his sepulchre.—(Melp., 71, 2.)

[4] A chief called *Black Bird*, when dying, called his warriors around him, and, like Jacob of old, gave commands concerning his burial, which were as literally fulfilled. The dead warrior was dressed in his most sumptuous robes, fully equipped, with his scalps and his war-eagles' plumes, and borne to a neighbouring height which commanded a magnificent extent of landscape.

interpretation, and that is, the belief in a future state, where the chief or king is to enjoy in another world the luxuries and pomp which he had left on earth.

If we trace, then, the universal belief in the immortality of the soul, from the simple savage who inters his friend with his hunting implements beside him; or the early warrior who was buried with his broken sword, to mark that his warfare was finished, and that in another world his sword would not be required; or the Roman with his slaves; or the Chinese with their tea and food; or the Red Indian with his horse, hunting-dogs, and favourite servants,[1] all point to an innate belief in futurity, which has been implanted in the breasts of mankind by the Creator of the universe.

I have thus dwelt on the very general, I may almost say universal belief in the existence of a spiritual element which leaves the body at death, and I have done so for the purpose of pointing out that it was necessarily the first link in the chain which led to a belief in spiritual appearances. The mind of man during intense grief, or great mental suffering, can readily, under certain circumstances, as we shall afterwards see, call up an image or illusion from his deep contemplation,—a mental picture, in fact, of the object on which his thoughts have been intensely fixed. This is natural to the human being, and must have existed in all ages, but when science could not explain it, it was believed to be a real representation. The belief in apparitions then was soon followed by the practice of showing them, and this became a trade in the temples of the nations of antiquity. Sir David Brewster has pointed out many methods, known to mechanical philosophers, by which appearances of this kind might have been produced. But it

To the summit of this bluff, on the Missouri, a beautiful white steed—the favourite war-horse of Black Bird—was led, and there, in presence of the whole nation, the dead chief was placed with great ceremony on its back, looking towards the river, where, as he had said, he could see the canoes of the white men as they traversed the waters of the Missouri; his bow was placed in his hand; his shield and quiver, with his pipe and medicine-bag, hung by his side; his store of pemmican and his well-filled tobacco-pouch were supplied to sustain him on the long journey to the hunting-grounds of the Great Manitou, where the spirits of his fathers awaited his coming. After various other ceremonies, the Indians gathered turfs and soil, and placed them around the feet and legs of the horse. Gradually the pile rose under the combined labour of many willing hands, until the living steed and its dead rider were buried together under the memorial mound.—(Wilson, p. 356.)

[1] The Assemites of Tartary bury their dead, and always put provisions along with them; and when the king dies, he is buried with his valuable effects, a large store of provisions, and his darling idol; his wives or concubines and his prime minister poison themselves, to show their love and loyalty, and be enabled to wait on him in another world; besides, twelve camels, six horses and elephants, and several hunting-dogs, are likewise buried alive along with him. —(Madden, vol. i. p. 316.) In Ashantee, at the death of any principal person, they always sacrifice slaves or young girls, to be buried with them and attend them in another world.—(Madden, vol. i. p. 275.)

appears to me that with our present knowledge of illusions of the senses, we can readily follow the production of apparitions at the will of the magician or sorcerer, without the necessity of introducing any mechanical or optical contrivances at all. Man's own intensely excited nature through his organs of sense could produce apparitions without the magician or sorcerer, and if he did apply for an exhibition of this kind at the hands of such a one, it would require little but a dim light, some monotonous sound and a grey back-ground to exhibit before the bodily eye the mental picture which had haunted his imagination. Such appearances under such circumstances are known to be readily produced at the present day, from causes which I will shortly have to explain, and I can see no difficulty in believing that they were produced in ancient times under similar circumstances, at the supposed will of the sorcerer, and with the very trifling assistance of a few simple accessories. In no other way can the frequent and complete failure of sorcerers and magicians, to produce an apparition when desired, be accounted for than this, for if they were in the habit of trusting to optical or mechanical contrivances, mirrors or lenses, or magic lantern representations, they ought always to have succeeded well or indifferently; but when we are told that the priests or magicians often failed to produce any appearance at all, it seems to me more probable that the failure arose from the want of the necessary amount of intensity in the grief or emotion of the individual seeking the appearance than from any other cause.

For the earliest notices of those occult sciences which have become known to us, through the channels of Greek and Roman literature, we must turn to the records of such monarchies as Chaldea, Assyria, Persia, and Egypt.

Prometheus, according to Servius, and Æsch. Prom. Vinct., 492, instructed the Assyrians in astrology; and the Assyrians are generally regarded, in classical antiquity, as the great masters and authors of the occult sciences. As Assyria was among the countries which were first peopled, it is remarkable that the first instances supposed to be mentioned in Scripture of the art of divination respects the images of Laban who was a native of Padan-Aram, a district bordering on that country.

The histories of Greece and Rome afford us sufficient information as to the points in question. Rollin tells us that, about the beginning of the Christian era, the practice of consulting oracles and the giving of responses was general, but that the responses were characterized as ambiguous, obscure, and convertible, so that one answer would agree with various and sometimes opposite events.

At this time, we are told the Magicians were always prepared to convince the sceptical by apparitions of the dead. It is recorded by Pliny, that in an ancient temple of Hercules, at Tyre,

there was a consecrated seat from which the gods or apparitions arose. At Aornos, in Thesprotia, there was also a celebrated oracle which is said to have delivered its responses by calling up the dead. Homer informs us, in the eleventh book of the Odyssey, that Ulysses, wishful to see his friends who had been long separated from him by death, went alone into a temple of this kind. He saw his friends, but a multitude of other apparitions and a terrific noise prevented any conversation. We are also told that the faithful wife of Protesilaus importuned the gods to grant her but for a moment to behold her husband, who had fallen on the shores of Troy; she no sooner saw his spirit than she endeavoured to follow him, and precipitating herself into the flames was destroyed.

From the East the visionary scenes of divination and incantation passed into Europe. The imaginative character of the Greeks easily procured it their welcome and respect. No nation ever attained greater celebrity for its arts of divination than Etruria; and although it was manifestly derived from the East, they pretended that they were the authors of this science, or at least its first recipients from the gods. The means by which they obtained this mysterious knowledge is thus stated. An Etrurian ploughman, happening to drive his share somewhat deeper than usual, was surprised by the sudden appearance of a boy from beneath the ground. This worthy rustic alarmed the neighbours, and all Etruria flocked to see this subterranean stranger, who was no other than a god, named Tages, and who taught the doctrines of divination, which were committed to writing. Cicero ridiculed the story (De Div. ii. 23), but the belief in the origin of divination in Etruria was general at Rome, where diviners from that country were in the highest estimation, and youths of the first Roman families were sent to Etruria, to learn this art on its native ground.

With the advent of Christianity, a better, more consistent, and purer faith supplanted the imagery and worship of the Pagan gods. It will be remarked that Rome at this time had reached its culminating point of idolatry. The gods were so numerous, and the votaries in the temples so great, that the Pantheon could not contain more; and although the Roman Empire was still in its glory, revelling in the magnificence of its temples, the number of its votaries, and the value of their offerings, no sooner did the obscure birth occur, which marked the advent of the Christian era, than the Roman Empire underwent a change; and half a century had not elapsed before Rome, which the census of twenty years before had declared to contain 2,000,000 inhabitants, was burned to the ground by the orders of Nero, the crime being charged against the Christians. Then follow the sad and lamentable persecutions of this sect, the rebuilding of temples, the occurrence of plagues, and the Imperial city attacked by savage hordes from

all sides, till at last the Pagan ereed was supplanted by Constantine the Great, who, in consequcnce of a vision, plaeed the Cross on his banners, began to favour the Christians, and, finally, ordered all the heathen temples to be destroyed. This happened in the year 330 of our era; and since then the worship of the Pagan gods, and the showing of apparitions to those who sought them as votaries in the temples, for ever ceased.

The destruction of the heathen temples, the downthrow of the Pagan faith, together with the increase and propagation of the purer doetrines of Christianity, did much to extinguish the general belief in the procuring of apparitions; but an evil, which had so long held captive the human race, was not at onee to be dispelled, and we find that it lingered on in all countries and took the form of superstition; and it is somewhat curious to trace the difference in the characters and forms of the supernatural agents in different eountries, and to observe how generally they are in accordance with the characteristics of the country and national peculiarities of the people. To illustrate this point would lead me away from the object of this communication, but it, nevertheless, would be a matter of easy demonstration. In this eountry, superstition took a mixed nature, being moulded out of the praetices of the Celts, the Scythians, and Teutonians.

During the Middle Ages, magic, soreery, and divination reached an extreme pitch, and historical data tell us of no less than thirty-one varieties of these dark arts, which were not only believed in, but followed by all classes of society. There was necromancy, gastromancy, onomancy, oomancy, axinomancy, etc., and pyromancy or divination from images seen in the fire. We have all been familiar as children with the general appearanee and divinitive effects of images seen in the fire; and if we are to judge of the others by the one under consideration, it would be difficult to contemplate anything which did not yield phenomena as much to be relied on as the images of pyromancy. The belief in witehcraft, or witch mania, as it has been improperly called, was but one of the phases of magic, sorcery, and incantation, so prominently popular during the darkness of the Middle Ages. In fact, the one gradually glided into the other and took its place. They had both a similar origin in the belief that disembodied spirits may be permitted to revisit this world, and that devils and demons or the spirits of evil were allowed to interfere in the affairs of mortals. Such ideas were practically applied to the living about the beginning of the sixteenth eentury, for at that time, in many countries of Europe and in our own, individuals were suspected of witchcraft on the most trifling foundation.

In fact, an epidemic terror seized upon the nations, no man thought himself seeure either in his person or possessions from the maehinations of the devil and his agents; every ealamity that

befel him, he attributed to a witch. If a storm arose and blew down his dwelling, it was witeheraft; if his eattle died of a murrain, if disease fastened upon his lambs, or death entered suddenly and snatehed a beloved faee from the hearth; these were not eonsidered as the visitations of Providenee, but were aseribed to the work of some neighbouring hag, whose wretehedness or peculiarities had attracted the attention of the superstitious, and put her down as a witch.

These suspected persons were eommitted to prison, fed on bad dict, and redueed to a condition of wretchedness in whieh death was weleomed as a relief from degradation. Be it remembered, too, that no one eseaped this foul suspicion,—man and woman, young and old, the beautiful and the ugly, the rich and the poor, for examples are to be found in all, but it was espeeially the poor, infirm, and ignorant that suffered, and the records of the period show that few were convicted unless on their own eonfession, and that that confession was generally wrung from them by the most eruel torture; many, indeed, denied their confession the moment they were relieved from the torture. In this way matters proceeded for nearly two centuries. The crime, although extracted from their own lips under torture, and devoid of all other proof, was met by the severest penaltics. In Germany, and most continental eountries, they were burned at the stake; but in Scotland, the usual sentence was, to be strangled, and the body afterwards to be burned.

The extent to which this dreadful sacrifiee of human life reaehed, for a supposed crime, may be estimated from the fact that in many cities of Germany there annually perished for this crime alone morc than six hundred individuals, amounting to two daily, Sundays excepted. But in other countries the same massacre of innocent people was going on; in Italy, France, and Great Britain, the number of victims were great, although no approximation of the numbers has been ventured upon.

In thc criminal trials of Scotland at this period, Mr Piteairn has gathered upwards of seventy, in most of which sentence of death was pronouneed and executed. Hume, in his History, tells us "that in a village, near Berwick, which contained only fourteen houses, fourteen persons werc punished by fire." [1]

In the year 1589, fourteen persons were eondemned to death for witehcraft in France. They appealed to the Parliamcnt of Paris. The Parliament named the King's surgeon, Pcgray, and three physicians, to visit the witchcs, and rcport. "We found them," says Picrre Pcgray,[2] "to be very poor, stupid peoplc, and some of them insanc. Many of them were quite indifferent about life, and one or two of them desired death as a relief from their sufferings. Our opinion was, that they stood more in need of medieine than of

[1] Hume, vol. vii. p. 186. Lond. 1792.
[2] Pegray's Surgery, book vii. chap. 10.

punishment, and so we reported to the Parliament. The Parliament ordered the poor creatures to be sent to their homes, without inflicting any punishment upon them." Such views began to show themselves elsewhere. We find the Lord Advocate for Scotland, in his work on Criminal Law,[1] published in 1678, expressing himself thus:—"That he was convinced that three-fourths of the prosecutions for witchcraft were unjust and unfounded, that the persons who were accused of such crimes were poor ignorant men and women, who did not understand the nature of the accusation, and who mistook their own superstitious fears for witchcraft. One poor wretch, a weaver, believed he was a warlock, and upon being asked why, he replied, because he had seen the devil dancing round the candle like a fly. Another poor woman, who was said to be a witch, did not deny it, but asked the judge if a person might be a witch and not know it. I know," says Sir George Mackenzie, "that the tortures to which these poor creatures were submitted was the ground of all their confessions; and albeit, these poor miscreants cannot prove this usage, the actors in it being the only witnesses, yet the judge should be jealous of it, as that which at first did elicit the confession, and from fear of which they dare not retract it." As an illustration of this, I may mention the case of a poor woman, who was condemned, and upon being carried forth to the place of execution, listened to the prayers which were being offered up for her without uttering a word, but upon perceiving that there remained nothing more for her than to go forward to the stake, she rose up, and with a loud voice addressed the assembly,—"All you that see me this day know that I am now to die as a witch by my own confession, and I free all, more especially the ministers and elders, from the guilt of my blood." "And as I must make answer to the God of Heaven presently, I declare I am as free of witchcraft as any child; but being delated by a malicious woman, and put in prison under the name of a witch, disowned by my husband and friends, and seeing no ground of hope of ever coming out again, I made up that confession to destroy my own life, being weary of it, and choosing rather to die than to live."

Pitcairn, in speaking of the remarkable trial of Bessie Dunlop in the year 1576, says, "She was certainly the dupe of her own overheated imagination, already well stored with such fancies."[2]

I have probably dwelt too largely on this painful subject,—on this superstition which infected all classes of society for nearly two centuries, and in nearly all countries, and may almost be said to have been universal. My object in doing so has been to show that the absurd confessions of these individuals could have had no existence but in their own imaginations; they told of having seen, heard, and felt beings which we know at the present day could have had no existence. Many of the confessions of what they had seen and

[1] Mackenzie on Criminal Law.

[2] Pitcairn's Criminal Trials, vol. i. p. 49.

heard were denied afterwards. But there can be no doubt that illusions of the senses, under excitement, superstitious fear, and dread of punishment, could, in weak minds stored with the numerous myths of the middle ages, speedily produce illusions of great intensity, and of many of the senses combined, so that, without the means of correcting or of recognising such, they must have been more than human to have disbelieved them. To illusions of the senses, then, must be referred the whole category of those superstitious notions which led to so much cruelty and bloodshed. It will be my province to record to you cases this evening which, if they had occurred in ruder times, would have been put down to sorcery or witchcraft, but which, in our day, are rationally explained by illusions of the senses.

In further illustrating this subject, and which I shall, as far as possible, do from original cases, I shall direct your attention—

I. To illusions of the senses, and the manner of testing them.

II. To illusions of the senses, as they are to be distinguished from the delusions of the insane, on the one hand, and vivid dreams on the other.

III. To illusions of the senses having their origin,—1*st*, in the brain; 2*d*, in the structures of the eye; and, 3*d*, in external impressions made during certain states of mental excitement.

IV. To the pathology of illusions.

I. *Illusions of the Senses, and the Manner of Testing them.*

"Illusions of the senses" are the ideas or recollected images of the mind referred to the respective nervous expansions of the organs of sense, to the retina of the eye, to the olfactory membrane, to the cochlea of the ear, or to the skin on different parts of the body. It is easy to demonstrate how an illusion of any of the senses can be produced, to trace the steps by which former impressions can be revived or recalled, or to show how an idea or new image of the brain can, under certain states of the bodily organs, be imprinted like a reality on the organs of sense. Thus, if one looks steadfastly on the sun or the image of the sun in a looking-glass, and then turns the eye to a dark corner of the room, the retina for a moment will retain the impression of the sun, but will almost immediately be succeeded by the spectral image of it. The same experiment exemplifies the recall of images. Thus, Sir Isaac Newton, in the course of his experiments on this subject, became so haunted with the image of the sun, that when he was in shade, twilight, or darkness, he had but to think of the sun when it immediately appeared before his eyes. "From recalling images by an act of memory," says Dr Ferriar, "the transition is direct to beholding spectral objects which have been floating in the imagination;" and Sir David Brewster has shown, that not only are the ideas or images of the mind seen, heard, and touched, but that the

nervous expansions of these different organs of sense are the common tablets on which all are respectively depicted, and by means of which they received their fancied existence.

It is known that blind persons have revived impressions in their mind's eye as bright and distinct as they ever saw them before their eyesight was lost. Dr Dewar, of Stirling, related to Dr Abercrombie the case of a lady who never walked out without seeing a little old woman, with a red cloak and crutch, who preceded her. "To see with the mind's eye," says M'Lachlan, p. 22, "is equally the privilege of the blind, though no longer capable of enjoying the beauties of nature, or fitted to transfer them to a canvass. Yet, former scenes are pictured to them as bright and beautiful as they were ever beheld."

Illusions of the senses have been recognised as such since the beginning of the present century,—in fact, since the time that Nicolai, the famous Berlin bookseller, broke through the superstitious belief of his time, and announced that the figures which tormented him by night and by day were only the phantoms of his imagination. I do not propose here to follow the progress which years, as they rolled along, threw on the subject of illusions. Nicolai's case was soon followed by papers on the subject by Dr Ferriar of Manchester, and Dr Alderson of Hull, and since then the volumes of Dr Hibbert, Sir Walter Scott, Sir David Brewster, and others in this country; also the work of Brierre de Boismont on Hallucination, and the large work, Sur la Mystique, by Görres, translated into French by Charles Sainte-Foi, carry sufficient evidence of the interest which this curious subject has created both in this country and on the continent of Europe.

I do not propose to relate to you a series of cases of all kinds of illusions, but rather to direct attention to the explanation of the phenomena, using cases only for the purpose of illustrating my views, and of showing the tests which individuals themselves have suggested to enable illusions to be distinguished from realities.

Hallucinations of the senses are at times very vivid, and it would seem that the higher the intellectual nature of the being the more vivid the illusion becomes. It is impossible to say whether the senses of the lower animals are subject to hallucinations, but this we know, that they are much less frequent in savage than in civilized life. The Esquimaux is said to recognise the images of his departed friends and relatives far away over the snow-topped hills in their land of bliss; and under suffering or approaching death, he addresses them and tells them how soon he will join them and hunt with them in their new country. But the being of high mental culture, occupied with the contemplation of his own mind, is more liable to have illusions than the savage, in consequence of the pathological conditions induced by sedentary habits, and the altered conditions which the circulation within the cranium undergoes in those who occupy themselves with the elucidation of mental or other abstract phenomena.

The vividness of such hallucinations is much increased when more than one sense is affected at the same time. As an illustration of this, I may shortly relate to you the case of a young medical man, who was not only an attentive student, but was also given to literary pursuits. He was going to bed after a hard night's study, when he accidentally turned up a letter from an old companion, long dead. The casual circumstance recalled some painful recollections to his mind, and while still meditating upon them he put out his candle to proceed to bed. He had hardly done so when the voice of his old companion addressed him, and at the same time he felt his arm grasped. With no fear about him, and suspecting the character of the visitation, he proceeded to relight his candle, when there stood before him, and within a few paces, the apparition of his old friend. It beckoned to the door, which my friend proceeded to open. The image glided out, and he immediately became giddy and fell down. Three senses, it will be observed, were in this case deceived, and yet the individual had no doubt of its being an illusion. He afterwards became more suspicious of his eyesight, especially in twilight or darkness, and produced the test of touch as the one most readily occurring to his mind to show whether the object was real or not. Four different methods have been suggested as tests to those who witness such phenomena,—first, we may put down the above simple plan of going forward and touching the object; second, we have the ingenious test which a patient of Dr Rutherford Russell's was in the habit of applying, and which was simply to turn his back on the suspected image,—if it was a reality, he lost sight of it; if it was in the mind's eye, a phantom of the imagination, he saw it as before. Thirdly, Sir D. Brewster has suggested another. He says, "I have found, on examining these mental impressions, that they follow the motions of the eyeball, exactly like the spectral impressions of luminous objects, and that they resemble those therefore in their apparent immobility when the eyeball is displaced by an external force." Here, therefore, we have a third and most important testing-point between real and imaginary bodies, by pressing one eyeball, and changing the axis of vision. If the object is real, it will be doubled; if mental, it will remain single. The fourth, which was applied by a patient of Sir James Simpson's, is equally interesting. This lady, who was subject to illusions of sight, told Sir James of the method she adopted to distinguish the real from the spectral. She had only to look towards a mirror to decide the point. If the image had its back to the mirror and its face to her, she concluded it was real; but if it had its face to her and also to the mirror, that it was an illusion—an interesting example of the innate power of a sane mind to distinguish a false from a real impression, by applying a new and ingenious test, capable of discriminating the one class of phenomena from the other.

II. *The Distinction to be drawn between Illusions, Delusions, and Vivid Dreams.*

But illusions of the senses must be carefully distinguished from the delusions of the insane on the one hand, and vivid dreams on the other. Writers on apparitions and allied subjects have not paid sufficient attention to the distinctions which ought to be drawn between these three related phenomena; but the peculiarities of each are not the less marked on this account. In the sane, all the senses may be deceived, but the reason and judgment never fail to introduce a test to the satisfaction of the individual that he has before him an illusion. Illusions, therefore, properly belong to the senses; delusions to the judgment. The meaning of these terms is often confounded; but while delusion is always connected with insanity, illusion is not indicative of mental disorder. "Illusions," says Dr Taylor,[1] "are sometimes met with in the sane; but when arising from external objects, the false perception is soon corrected by a reference to the other senses; and herein consists the main difference between sanity and insanity, viz., *delusion*, or a misleading of the mind. When the hallucination or illusion is believed to have a positive existence, and that belief is not removed either by reflection or an appeal to the other senses, the person is insane; but when the false sensation is immediately detected by the judgment, and is not acted on as if it were real, then the person is sane."

But the line of demarcation which bounds the illusions of the sane from the delusions of the insane is often a narrow one. Cases occasionally occur in which the illusive impression becomes so permanent and constant as to be believed in as real, and converted into that of a delusion. A case given in detail by Sir W. Scott illustrates this. The subject of it was a professional man, highly esteemed, of unusual steadiness, good sense, and integrity, well advanced in years, and prosperous as regards worldly circumstances. His depression of spirits and other symptoms began to alarm his family, and the family physician, after a time, prevailed upon his patient to disclose to him the cause of his symptoms. His visions began years before this period by the presence of a large cat, which came and disappeared he could not tell how, till the truth forced itself upon him that it was no domestic cat, but, as a bubble of the elements, had no existence save in his own visual organs or depraved imagination. This apparition was afterwards followed by that of a gentleman-usher, arrayed in court-dress, with bag and sword, lace-bound waistcoat, etc., and, whether in his own house or another, ascended the stairs before him as if to announce him in the drawing-room. This illusion was, after a few months, changed to one more horrible,—that of a skeleton, which was always present with him, alone or in company, and never quitted him. His physician was distressed to perceive how strongly this visionary apparition was

[1] Taylor, Medical Jurisprudence, p. 1025. Edit. 1865.

impressed on the imagination of his patient. He urged the sick man, who was then in bed, with questions for the purpose of leading him, as a sensible man, into such contradictions and inconsistencies as might bring his common sense, which was unimpaired, so strongly into the field as to combat successfully his fantastic disorder. "The skeleton, then," said the doctor, "seems to you to be always present?"—"It is my fate," answered the invalid, "always to see it."—"Then I understand that it is now present to your imagination?"—"To my imagination it certainly is," replied the sick man.—"And in what part of the chamber do you see it?"—"Immediately at the foot of the bed, when the curtains are left a little open," answered the invalid; "the skeleton, to my thinking, is placed between them, and fills the vacant space."—"You say you are sensible of the delusion," said the doctor; "have you firmness to convince yourself of the truth of this? Can you take courage, rise, and place yourself in the spot so seeming to be occupied, and convince yourself of the illusion?" The poor man sighed, and shook his head negatively.—"Well," said the doctor, "we will try the experiment otherwise." Accordingly, he rose from his chair by the bed-side, and placing himself between the two half-drawn curtains at the foot of the bed, indicated as the place occupied by the apparition, asked if the spectre was still visible. "Not entirely so," replied the patient, "because your person is betwixt him and me; but I observe his skull peering above your shoulder." The patient sunk into deeper and deeper dejection, and died in the same distress of mind as he had spent the latter months of his life,—a melancholy instance of the power of a diseased imagination to kill the body, even although its fantastic terrors could not overcome the intellect of the unfortunate individual.[1]

But hallucinations of the senses are also to be distinguished from vivid dreams. We generally find that those who are in the habit of seeing spectral illusions see them during the day-time, or with artificial light, but always with their eyes open; while the illusion which follows a vivid dream is only the bright dream-impression continued by means of external phenomena after the individual is awake.

Dr Ferriar[2] of Manchester has well related the case of a gentleman who was benighted while travelling alone in a remote part of the Highlands of Scotland, and was compelled to ask shelter for the evening at a small lonely hut. When he was conducted to his bedroom, the landlady observed, with mysterious reluctance, that he would find the window very secure. On examination, part of the wall appeared to have been broken down to enlarge the opening. After some inquiry, he was told that a pedlar, who had lodged in the room a short time before, had committed suicide. According to the superstition of the country, it was deemed improper to

[1] Demonology and Witchcraft. By Sir Walter Scott.
[2] Ferriar's Theory of Apparitions.

remove the body through the door of the house, and to convey it through the window was impossible without removing part of the wall. Some hints were dropped that the room had been subsequently haunted by the poor man's spirit. This gentleman laid his arms properly prepared against intrusion of any kind by the bedside, and retired to rest, not without some degree of apprehension. He was visited in a dream by a frightful apparition, and awaking in agony, found himself sitting up in bed with a pistol grasped in his right hand. On casting a fearful glance round the room, he discovered, by the moonlight, a corpse dressed in a shroud reared erect against the wall, close by the window. He summoned resolution to approach the dismal object, passed one hand over it and felt nothing, and at length discovered that the object of his terror was produced by the moonbeams forming a long bright image through the broken window, on which his fancy, impressed by his dream, had pictured with mischievous accuracy the lineaments of a body prepared for interment.

An anecdote related by Dr Abercrombie[1] also illustrates this point. It occurred to an eminent medical friend, who had sat up late one evening in considerable anxiety about one of his children who was ill. He afterwards fell asleep in his chair, and had a frightful dream, in which the prominent figure was an immense baboon. He awoke with the fright, got up instantly, and walked to a table which was in the middle of the room. He was then quite awake; but close by the wall in the end of the apartment he saw the baboon, making the same grimaces which he had seen in his dream; it continued visible about half a minute and disappeared. Again, Dr Abercrombie relates that two esteemed friends of his, while travelling in the Highlands, had occasion to sleep in separate beds in one apartment. One of them having awoke in the night, saw by the moonlight a skeleton hanging from the head of his friend's bed. He instantly got up to investigate the source of the illusion, and found it to be produced by the moonbeams falling upon the drapery of the bed, which had been thrown back in some unusual manner on account of the heat of the weather. He returned to bed, and soon fell asleep; but having awoke again some time after, the skeleton was still so distinctly before him that he could not sleep without again getting up to trace the origin of the phantom. Determined not to be disturbed a third time, he brought down the curtain into its usual state, and the skeleton appeared no more.

III. *Hallucinations of the Senses*

Naturally divide themselves—1st, *Into the mental, or those originating in the brain, and referred to the organs of sense;* 2d, *To those which have reference to the eye itself, and have their origin in its structures;* 3d, *To those which arise from the impression of outward objects on the senses, under certain states of mental excitement.*

[1] On the Intellectual Powers, p. 367.

1*st*, then, we have to consider *Illusions having their origin in the brain, but which are referred to the different organs of sense.* In the state of perfect health, the relative intensity of these two classes of impressions—viz., the external and internal, the bodily and the mental—are nicely adjusted, and unless in a deep reverie, there is no displacing of the external picture by the mind's picture. But that images of the mind can, in certain states of the organs, displace with the vividness of reality the external picture, there can be no doubt. I might adduce many examples, from the first recorded illusions of the Berlin bookseller, Nicolai, up to our own days, to prove this; but it is unnecessary, every one now recognises the fact. I shall therefore address myself more particularly to the explanation of this fact, or how mental impressions should take certain forms in certain cases; and we shall find in the course of this analysis that illusions of the senses are always to be found in consonance with the train of thought or mental imagery which has more or less intensely occupied the thinking powers of the individual, or, having been forgotten for a time, are suddenly recalled by some casual circumstance.

I shall illustrate this by a few examples.[1] I shall more particularly record to-night the case of a lady who beheld an illusion of the form of her father, on her being suddenly seized with a feeling of fainting on going up a stair. This illusion was no doubt suggested to her mind by having casually fallen upon and perused a letter of her father's, written shortly before his death. Her mind was unconsciously dwelling on his form and figure as she proceeded up stairs, and when she was suddenly seized with a feeling of faintness, the illusion which appeared to her assumed the form of the individual on whom her mind was at the moment dwelling.

A gentleman, says Dr Hibbert,[2] was told of the death of an old and intimate friend, and was deeply affected by it. The impression, though partially banished by the business of the day, was renewed from time to time by conversing on the subject with his family and other friends. After supper he went to walk in a small court behind his house. The sky was clear, the night serene, and no light was falling upon the court from any of the windows. As he proceeded across the court, the figure of his deceased friend started up before him in a most distinct manner at the opposite angle of the court, wearing a coat of a different

[1] The illusion of Martin Luther is sufficiently illustrative, although he himself referred it to the devil. "Being at prayers," says he, "and contemplating how Christ hung upon the cross, and suffered for our sins, there appeared suddenly on the wall a bright shining vision, and thereon appeared also a glorious form of our Saviour Christ, with his five wounds, steadfastly looking upon him as if it had been Christ himself corporeally. At first he thought it was some good revelation, but presently suspecting some juggling of the devil, said, 'Away, thou confounded devil, I know no other Christ than he which was crucified,'—whereupon the image vanished."

[2] Hibbert on Apparitions.

colour from usual; and as he gazed the image seemed to grow more and more distant, and disappeared.

A lady, two months after losing her father, who was strongly attached to her, was sitting late at night at the side of her bedroom fire, and meditating upon the loss she had sustained in such a loving and good parent, when suddenly her deceased relative seemed to enter the room, walked to the opposite side of the fireplace, and took his seat there. On this she fainted, and when she recovered, the startling vision had gone.[1]

This illusion had in all probability its origin in some sudden loss of balance of the cerebral circulation, and the form assumed is explained by the character of the meditations at the time.

In the *Christian Observer* for 1829, the writer details the case of an intimate friend of his early years, and most happy in his domestic arrangements, who lost his wife under the most painful circumstances suddenly, just after she had escaped apparently from the dangers of an untoward confinement. A few weeks after this event, while travelling during the night on horseback, and in all probability thinking over his sorrows, the form of his lost relative appeared to be presented to him at a little distance in advance. He stopped his horse, and contemplated the vision with great trepidation, till, in a few seconds, it vanished away. The case of the medical student, related at page 14, also well illustrates this view of the matter. His mind was dwelling on the studies of the evening, when a letter from his old companion casually turned up; he read it, and thought of his old friend's melancholy fate. This casual circumstance no doubt gave origin to the vivid train of ideas which terminated in the illusion of his friend.[2]

Sir James Simpson related to me the following case:—On an occasion when the family was occupying a very large and extensive country mansion, there was some conversation at the breakfast-table about a book which had recently appeared. This lady strongly recommended her mother to read it, but nothing more passed at the time. A few hours afterwards, while sitting in her own room, her mother entered and went to a table where some books lay, for the purpose of searching for the volume which had been spoken of in the morning; but, knowing that it was not there, but in the library, she immediately said to her mamma that the volume was not there, but down stairs, and that she would go and fetch it. Upon passing down stairs and through a large hall, and upon entering the library, there sat her real mother perusing the book in question, the figure up stairs having been a spectral one, produced, no doubt, by her mind acutely dwelling on the conversation of the morning. Upon entering the library and seeing her mother, she swooned away.

Sir J. Simpson has also, with much kindness, put at my disposal the particulars of a case which illustrates well the views I at present

[1] Sir James Simpson. [2] See Edin. Med. and Surg. Journal, vol. ix. p. 83.

wish to develop,—viz., that in cases where illusions occur they always represent objects on which the mind has been dwelling, or which have suddenly been recalled to it. A lady became a patient of Sir James's some months after losing her father, who was strongly attached to her as his only daughter, she being also devotedly attached to him. She was weak and nervous, and fancied that some of her early illusions were connected with the approach of insanity. She was taught, however, to test them, and felt much relief in discovering that they were illusions. The particular and most striking one which so well illustrates the present view, I shall relate in the words of Sir James Simpson himself. "After residing at the Granton Hotel for some two or three weeks, and some months after her father's death, she fell into a desponding state, for which it was found impossible to do much, or indeed anything, medically. On calling early one forenoon, she said to me in an excited tone—'Doctor, you must allow me to prescribe for myself to-day.'—I answered, 'Most certainly.'—'Then,' continued she, 'you must show me a dead body.' I remarked that I could not possibly do that without having her husband's consent. On consulting with him, he thought that, if possible, her wishes should be gratified, as she had for a week or two been most unhappy. My patient, her husband, and myself, forthwith drove up to the University, when I explained to Professor Goodsir the strange and unique medical prescription which my patient had ordered for herself. A body, recently dead, had by accident been brought into the anatomical rooms that morning. Professor Goodsir himself led us to the room in which the corpse was lying. My patient, who had never seen a dead body before, walked forward to it, and with both her hands grasped one of the dead man's arms, and held it for a considerable time. She refused at the time to give either her husband or myself any reason for her proceedings. Some short time afterwards she explained them to me, thus. After coming to the Granton Hotel, it happened night after night, that soon after retiring to bed, and while still awake, her bed-room door seemed to open, and then there entered a spectral procession of bearers carrying the dead body of her father. After marching round the room they always laid her father's corpse beside her in bed, and she had argued herself into the belief that if she once felt the real dead coldness of a real dead body she would know the difference between it and that which she was well aware was merely a spectral one, and thus be able to dispel the terrible illusion. The prescription, being one of her own devising, naturally, in such a constitution, had the effect expected from it in her own mind, and the nightly visits at once ceased." This lady has been well for many years, with the exception of the occasional occurrence of illusions. At these times she feels somewhat unwell, and is always reminded of the illusions by the entrance of a dog, who lounges about various parts of the room. On one occasion, while she was

telling Sir James of this, he asked, if she now saw the dog? She said, "Yes, to be sure, under your foot." This lady's case has recently assumed a somewhat curious form, and one which is important in a medico-legal point of view. Her mind has become so familiarized to illusions, that she is always in the habit of testing what she sees before her. For instance, she would never think of putting a plate or glass on a table without feeling if there was really a table there, and so on with other portions of furniture. She is never sure of sitting down without ascertaining that the chair is a real one; and she has assured Sir James that, if she was to be summoned as a witness and questioned, she could not swear whether what she saw was real or illusory. One can easily realize the astonishment of the bench and bar at the examination of such a witness. But, nevertheless, it is important to be borne in mind that illusions of the sense of sight can be so continued and deceptive as to render it impossible for a witness, under certain circumstances, to swear that what she saw was true or false—was a reality or an illusion.

A case of painful interest recently occurred to me, and although it naturally should be placed among those illusions having their origin in some foreign ingredient circulating in the blood, I prefer to place it here as it further illustrates the manner in which illusions occur, from contemplation of particular circumstances which have made a deep impression on the individual's mind, although they may be forgotten for the time. "A married lady, of great beauty and piety, was somewhat suddenly seized with the unmistakable symptoms of acute tuberculosis. Her illusions were always most distinct; she believed that many of her deceased relatives, friends, and acquaintances, visited her at her bed-side; she conversed with them, and often drew the curtain of the bed as if to behold them more distinctly; she afterwards told those about her what she had seen, but remarked that they were all clothed in white. It is somewhat remarkable that none of her living relations were ever depicted to her, and only those that were dead were recognised and spoken to." The explanation of this curious case does not appear difficult. An individual much engaged in contemplating the Scriptures must have often thought, as her friends and relations passed away, that they had gone to that better land where angels and the redeemed are spoken of as "clothed in white," "in white raiment," "raiment white as snow." The mental association of her departed friends in glory, no doubt, produced the particular characteristic which the illusion assumed: so her departed friends appeared to her clothed in white.[1]

Superstitious belief could give such apparitions a very different and probably even a more captivating explanation.

[1] A curious corroboration of the above expressed view was given me by the husband of this lady, since these pages were in type. Some months previous to her death, she asked his permission to peruse a sermon he had preached on the text, "They shall walk with me in white: for they are worthy."—Rev. iii. 4.

A case in every way illustrative of this view was, some years ago, mentioned to me by our respected President, Dr Dunsmure, as having been witnessed by a medical friend of his. This gentleman had been forcibly struck with the countenance and appearance of a respectable stranger, who expired suddenly in a public omnibus. He was soon afterwards called to examine the body by order of the procurator-fiscal. The benignant countenance and sombre (Quaker's) dress made a deep impression on him. He did not think longer of it than the circumstances required,—in fact, it had almost vanished from his mind, until while writing in his library one afternoon, and looking up to one of the pictures on the wall, the vision of the dead stranger stood before him, entirely concealing the picture from his sight, and presenting in every respect such distinctness of outline.

The deep impression made upon this gentleman by the circumstances attending this painful case, had unconsciously been occupying his mind more than he knew of, so when the image of the Quaker stood before him, he was much startled to behold it.

Many illusions of sight have been recorded, of which I have to-night quoted more than one, where the image appeared as a skeleton. Now, as Dr Hibbert has shown that much of the superstitious belief in devils, demons, etc., was drawn from the sculptures which adorned the doorways and windows of mediæval buildings, so with the image of the skeleton, it may be said to be the ordinary representation of death; and in those who feel bodily illness, especially of a somewhat obscure kind, nothing is so liable to engage their contemplation as death; they therefore picture him in the form of a skeleton, and dwell much upon it, and it rises as such with the first mental picture that is exhibited to them.

To this class of illusions of the senses also I am inclined to refer those stories of apparitions of murdered persons haunting the murderer until driven to give himself up to justice; many examples of this kind are on record. The late Dr Abercrombie explained this by the impressions which faint light, mental emotion, and especially an arrangement of external circumstances, produce; but I think it ought more properly to be referred to the present head of our subject—to a mind haunted by the image of his victim, or the scene of his murder, gradually and with increasing intensity producing a mental picture, which finally assumes minuteness and the lineaments of a reality, the contemplation of which becomes no longer endurable.

2*d*, *Illusions having their Origin in the Structures of the Eye.*—We now come to speak of those illusions which have their origin in the peculiar structures of the eye itself; and it is necessary for me here to suppose that my readers are familiar with the anatomical structure of the eyeball. When a ray of light enters the eye, it passes through the humours or lenses, and is formed by them into an image on the choroid of the object looked at. The extremities

of the rods and cones (or Jaeob's membrane) have the power of appreciating the image then formed, and convey it up through the ultimate parts of the retina, thence along the optie nerve fibres to the brain. Mr Brown[1] is inclined to regard the extremities of the rods and eones as the true seat of perception, in consequence of observing a considerable distance between the retinal blood-vessels and the choroid, when performing Purkinje's experiment. This experiment eonsists in passing a lighted candle slowly to and fro before the eyes, at about two or three inehes from the nose, when the retinal vessels will exhibit themselves before the observer not unlike branching trees. They may be seen by daylight by passing the large teeth of an ordinary comb slowly backwards and forwards before the eye, whilst looking on a smooth sheet of paper or upon the sky. There is a spot which is the direct centre of the retina, it is the seat of the most distinct vision. There is another spot, the centre of the entrance of the optic nerves, and from which the retinal artery is to be seen emerging, dividing, and sub-dividing; at this point there is no vision. The background to the artery naturally appears of a pale red, exeept at the part oeeupied by the optic nerve, where it is white.

"After so rapid a glance at so complicated a structure, and bearing in mind that some persons can see at various parts with vastly greater facility than others, it cannot be a matter of surprise that individuals not aware of these facts are now and then, especially at night and when carrying a light about, startled by what they fancy an apparition, but which is in reality nothing more than some part of the structures above considered. A lady assures us that she saw the ghost of her husband as she was going down stairs with a lighted candle in her hand. The central retinal spot when seen against a wall a few feet distant appears about the size of a human head, and wants very little to furnish it with features; figure-paper on the wall and a host of other things may supply them, or even the branches of the retinal artery, which often lends body and limbs."[2] But besides illusions formed from the structures of the eye itself, a beautiful experimental illustration ean be shown of the effect of the impressions of the various prismatic colours on the retina. "When we look steadfastly at a red object for a few seconds, that part of the retina on which the image impinges begins to get less sensitive to vibrations producing red, but more sensitive to those producing blue and yellow, so that on turning the eye away from the red object and permitting a little white light to enter it, that part of the retina which received the red image will in consequence of its diminished sensibility to the colour, and its exalted sensibility to blue and yellow, be able to pereeive the two latter eolours best, and by their mixture will give rise to a green image of the red object." The same thing will be observed with all

[1] See Brown of Brighton; Spectropia.

[2] Brown's Spectropia.

the other colours; the secondary image or *spectre* always appearing of the complementary colour to the object from which the impression is obtained.

The duration and vividness of these impressions on the retina vary greatly in different individuals, and can be procured from almost any object, and it is only necessary to look very steadfastly at any object of a primary colour for a few seconds, and to remove it and substitute a screen, not brightly illuminated, or of a grey colour, when the image will reappear again and again, but always of the colour complementary to the primary one,—red, green, blue, orange, yellow, purple. For amusing and instructive illustrations of this kind, I beg to refer to Mr Brown's little book on Spectropia.

3d, Illusions arising from the impression of outward objects on the retina under certain states of mental excitement.

External objects viewed with different conditions of light, or when the light is impinging upon them in a peculiar manner, may assume various and very fanciful appearances. Three cases will aptly illustrate this head: the first by Sir Walter Scott. "Not long ago," says he, "after the death of an illustrious poet, who had filled a great station in the eye of the public, a literary friend, to whom the deceased had been well known, was engaged during the darkening twilight of an autumn evening in perusing one of the publications which professed to detail the habits and opinions of a distinguished individual who was now no more. A visitor was sitting in the apartment, who was also engaged in reading. Their sitting-room opened into an entrance-hall, rather fantastically filled up with articles of armour, skins of wild animals, and the like. It was when laying down his book and passing into this hall, through which the moon was beginning to shine, that the individual saw right before him and in a standing posture the real representation of his departed friend. He stopped for a moment, so as to notice the wonderful accuracy with which fancy had impressed upon the bodily eye the peculiarities of dress and posture of the illustrious poet. Sensible of the delusion, he stepped onwards towards the figure, which resolved itself, as he approached, into a screen occupied by greatcoats, shawls, plaids, and such other articles as usually are found in a country entrance-hall."[1]

A strikingly corroborative case was published some years ago. "I was called hurriedly out of bed on a summer night to a patient who was said to have committed suicide. I reached the house in time to see her expire. She was found lying huddled up on the door-mat, her friends having fled from the house in terror of her appearance from the loss of blood. She was a respectable young woman, good-looking, and her history was a melancholy one. The details of her sad end were brought before me again and again for several weeks, in consequence of my being concerned in arranging

[1] Sir W. Scott's Demonology and Witchcraft.

pecuniary matters with her friends. Many months afterwards I was called again professionally to the same house. It was evening, and the moon was shining brightly as I ascended the stairs; the door of the house was open, and, to my astonishment, the first thing that my eye encountered was the door-mat with its dying burden, as bright and distinct as when I first beheld it. I was much struck by the circumstance, knew the nature of the illusion, and paused for a time to observe with what accuracy fancy and the effect of the moonbeams had brought back a recurrence of the associations connected with my former visit. Upon reaching the door-mat, I found that it was only a shawl or some such covering which had been accidentally dropped there. I was not aware on approaching the house on this occasion of my mind dwelling on my former visit, nor could I again reproduce the image as I left the house, although the same materials were present: the shawls lay on the door-mat, the moonbeams fell as before, but the spell was broken."[1]

Two ladies, while residing in the country in the course of last autumn, had been told of the peculiarities of a certain old woman who inhabited a cottage at no great distance. It was said that she lived alone with her cat, pig, and poultry, and that she occupied herself entirely in spinning with the old-fashioned wheel and distaff. They determined to visit her. It was a pleasant evening,—the sun was just setting, throwing lights and strong shadows on the landscape as they approached the thatched dwelling of this solitary. One of the ladies remarked to the other that she heard the burr of the spinning-wheel; and, as she entered the little garden, she further remarked that she saw the woman spinning at her cottage-door, and the flax from the distaff floating in the air. On approaching the door, however, no one was there; the door was shut, and, on inquiry, they learned that the old woman had not been out that evening. She was then sitting at the cottage-fire, and received the ladies with the usual salutation of the country. Both ladies were much surprised at this, for although only one of them had heard the sound of the wheel, and seen the old woman sitting at the cottage-door, still the impression made upon the one had so affected the other that they both looked in surprise when it turned out that there had neither been old woman nor spinning-wheel at the cottage-door that evening. Their explanation on their return that evening turned on the supernatural, but our explanation will be more simple. Their imaginations had been excited about this old woman and her spinning-wheel, and, as they approached, the fancied sound and subsequent illusion of the old woman at her cottage-door was only in consonance with their train of thought at the time, and with the effect of the strong shadows of evening throwing, from some unexpected source, and on a neutral background, a fantastic resemblance of an old woman and her distaff.

[1] Edin. Med. and Surg. Journal, No. 129.

IV. *Pathology.*

In treatises on this and allied subjects, allusions have been made to the probable pathological condition of the brain and its investing membranes, at the time when these phenomena occur. But no division of them has been given which appears satisfactory or is in accordance with recorded cases, or with the present state of our pathological knowledge.

I propose therefore to consider illusions as having their origin,—

1*st*, In passive hyperæmia, or congestion of the membranes of the brain.

2*d*, In a diminished supply of blood to the membranes of the brain, as shown in (*a.*) cases of fainting; (*b.*) cases of old age. And,

3*d*, Where foreign substances circulate in the blood of the brain.

It will be observed that I entirely exclude from this division the illusions of acute inflammation of the brain and its membranes, of fevers, and of delirium tremens. These are connected with active hyperæmia, or determination of blood to the arteries and capillaries of the membranes of the brain or brain itself, and are, like the delusions of insanity, looked upon as real, cannot be corrected by the other senses or by the reason, but disappear with the subjugation of the inflammation, the crisis of the fever, or the refreshing sleep of the drunkard.

1*st*, We shall consider cases having their origin in passive hyperæmia, or congestion of the membranes of the brain. Nicolai felt what he calls giddiness and congestion in the head before his spectral illusions appeared. He was in the habit of being periodically bled twice in the year at certain seasons, and when, from some misfortunes coming upon him, he neglected them, he began to experience fulness of blood in his head, and then to have illusions. This was congestion of blood in the membrane of his brain.

In the sixth volume of Hufeland's Journal, an illustrative case is given. "An intelligent person was sitting one evening in his chamber when the door seemed to be suddenly opened, and a person entered, whom he knew to be a friend, walked up to, and stared at him. He rose to meet his visitor, but when he approached him, the form vanished. Soon afterwards it returned, and with it a number of other persons known to the gentleman, all of whom stared at him and flocked round him. This phantom assembly, in the course of a quarter of an hour, increased to such an extent that the apartment could scarcely contain them. When he retired to his bed-chamber, he was equally followed by them; they flocked round his bed, and it was with difficulty he slept. He knew perfectly that they were phantoms, and felt no dread. They gradually disappeared after local blood-letting.

An interesting case of a similar kind occurred to the late Dr Gregory. His patient, an individual of rank, was in the habit of

seeing at a certain hour after dinner the form of a hideous hag enter the room with a most malignant aspect of countenance, and strike him on the head with her staff. The Doctor dined with him one day, and tried by animated conversation to draw away the time beyond that at which the visitor generally made her appearance. The clock had scarcely struck the usual hour, however, when the gentleman exclaimed in an alarmed voice, "The hag comes again!" and immediately dropped away in a swoon. The physician caused him to be bled, and satisfied himself that the periodical attacks arose from congestion in the head, and were of the nature of apoplexy.

2*d*, The next condition of the circulation of the membranes of the brain which we have to consider in connexion with the production of illusions of the senses is that of insufficient or diminished supply. It looks somewhat perplexing to say that these phenomena can be produced from two directly opposite states of the circulation within the cranial case; but the explanation of it seems to me not difficult.

The brain is an organ of the most delicate structure and mechanism, enclosed within a set of tough membranes and bony case. When, therefore, any sudden want of balance takes place within the cranium, it cannot be so suddenly corrected as if the brain was placed, like other organs of the body, free from its bony covering, and ready to be acted on by the external pressure of the atmosphere or other agencies within the body itself. So, when a person has an illusion on assuming the erect position, after loss of blood, and in the act of fainting, the heart has not had sufficient power to correct this sudden deficiency of blood in the capillaries and vessels of the membranes of the brain, and brain itself; and the moment it does so, either from change of position or from the action of the heart becoming stronger, the illusion disappears. The same applies to congestion: only there it comes on more strongly than the other; but here also the proper balance is deranged by there being a larger quantity than usual of blood within the system; hence, the moment you correct this by blood-letting, the illusions disappear. It may be affirmed, then, that the condition which is most liable to produce illusions is want of balance; and we shall see, as we proceed, that we have a strong proof of this in the illusions of old age: the brain and its membranes being continually out of balance, from a change in the textures and tissues of the aged.

This is sufficiently explained when we consider the textural changes which occur on the brain and its membranes in advanced life. As age advances, says Dr M'Lachlan, the brain begins to lose weight, to waste, and become harder; and the membranes become thicker, more opaque, and more resisting. This is especially the case with the arachnoid. The dura mater also becomes strong and adheres firmly to the skull. This condition (on which I might greatly enlarge did your time permit) acts, in all probability, by

preventing the due quantity of blood from circulating in the meninges of the aged, and, as in the case of the weak or faint, becomes a common source of illusions of the senses.

There has been much difference of opinion as to the pathological conditions of the brain and its membranes which give rise to illusions of the senses. Dr Craigie, while not denying congestion as a cause, referred much to the derangements of the digestive organs. Others have referred them to the exhaustion which follows night-watching, or diseases in which the nervous powers are worn out. While there can be no doubt that the latter can cause such phenomena in the strong and healthy, they become completely at fault in explaining the great majority of cases: those of the aged; of the weak and fainting; those who see them the result of morbid poisons circulating in the blood, or of foreign ingredients introduced into it; or those cases, such as Nicolai's, where there is congestion which requires to be removed by local or general depletion before the illusions disappear. The cases which have now been put on record, with all their particulars, are too numerous and varied for us to dogmatize. We have but to look at the functions of any other important organ, apart from the brain, and we shall see that very varied conditions of it pathologically produce very similar results. I cannot see, then, why we should fix on the brain, and through it the organs of sense, to produce illusions of the senses only and under one condition. If exhaustion of the nervous energy gives rise to these phenomena, I am prepared to admit it; but exhaustion acts only as weakness, and as the feeble circulation of old age does, by preventing the due supply of blood by means of which the functions of the brain are properly and normally performed; but this will never explain the other, and we have thus at once to refer to the divisions which I have made as including all those cases with which we have been made acquainted.

A lady, about middle age and of a robust constitution, had laboured under a prolonged attack of influenza. She was very weak, but yet was able to go about the house. Her father, a man of singularly benevolent disposition, of a striking aspect of countenance, and much beloved by her, had been dead for several years. She had accidentally fallen upon some letters of his, and was reading them when she was suddenly summoned up stairs. She immediately left the room and hurried up stairs as fast as her weak state would permit. She had not proceeded far before she became faint, and leant over the railings to rest; in doing so she beheld the image of her father standing at the foot of the stair, clad as usual, uncovered, and exhibiting his grey hairs. She looked steadfastly at him, and recognised his loving and benevolent countenance. She felt no alarm, but continued to gaze steadily at him; he gradually became dimmer and disappeared. It will be observed that this illusion disappeared with the return of the proper cerebral circulation.

Sir James Simpson, many years ago, detailed to me the history of a lady who was subject to frequent attacks of fainting, on the occurrence of which she saw various spectral illusions. On one occasion her father, who had been dead fifteen months, suddenly appeared to her and seated himself in the chair he was in the habit of occupying. He remained a short time intently looking upon her, and then disappeared.

The relations of a lady occupied, one season, a very large mansion-house in the neighbourhood of Edinburgh. One evening all the rest of the family came into town to a dinner-party, leaving her alone at home and somewhat unwell; she was very subject to attacks of fainting. After they left she felt dull, and tried to divert herself for a time by playing on her banjo. Soon afterwards a gentleman entered the room, whom she supposed to be some one calling for her mother. He advanced, however, to her and put his fingers upon her shoulder, when she instantly threw up her hand and arm to strike off the rude touch of this stranger, but her suddenly-uplifted hand struck nothing but empty space; and she swooned away as the thought broke upon her that, here in her solitude, she was visited with a new spectral figure. In this case, says Sir James Simpson, there was an illusion of touch as well as of sight. This illusion is also to be referred to some feeble circulation of the membranes of the brain going on at the time.

On one occasion, says Sir James Simpson, when this lady was sitting at a dinner-party, and was laughing along with others at some joke which had been uttered by some gentleman opposite her, upon looking across the table during this fit of merriment, she suddenly screamed out and fainted; for, behind her opposite neighbour, she suddenly saw the head of a former (dead) companion looking steadfastly at her, and slowly shaking her head as if to reprove her for her levity. I was once, says Sir James Simpson (who has kindly given me these particulars), present and near her at dinner, when she saw some illusion; what it was I could not ascertain. She shrieked and ran off to her bed-room. When her mother and I followed her, we found that she had thrown herself upon the top of her bed, and was staring and squinting unconsciously; and it was some hours before she recovered from this state. On several occasions this lady told me she was warned of the approach of an attack of illness by seeing a spectral dog walking about the room or lying upon the carpet.

It appears most probable that this lady laboured under deranged (feeble) health, that the circulation was by no means forcible, that in all likelihood the state of the blood itself was abnormal, and that when any circumstance, such as that of an exhaustive laugh, prevented temporarily the due supply of blood to the brain, an illusion was the result. In this way, I have no difficulty in classifying this very interesting case with those numerous ones arising from a temporary want of balance in the circulation within the cranium.

Of a similar nature, but always more permanent, are those illusions which arise from the pathological changes which take place in the brain and membranes of the aged. I believe that the phenomena of spectral illusions in people of advanced life bear an immeasurably greater proportion to those of any other period of existence, from all causes combined. I have looked over the history of almost every recorded case of illusions of the senses, and I find that, where the age is either actually stated or can be drawn from the remarks of the narrator, nearly two-thirds of the whole cases arise from those changes which take place in the brain, the result of advanced age.

Those of the medical profession who are conversant with the diseases of advanced life are, among many other peculiarities, familiar with their illusions. An old lady, still alive, and at present under my care, often declares that she has been removed to another house by my orders; feels wretched at being away from her own house, and yet is struck with the fact that the furniture is the same as her own. Another very estimable old lady, recently dead, at the age of eighty-nine, had a variety of curious illusions. Her old companions and friends of the end of last century used to appear before her dressed in the costume of that period. She accosted them all by name, and talked to them of the people and events of that time. In both of these cases, such illusions were frequent but not constant, and seemed to depend on mere accidental causes.

But I could not illustrate this department of my subject better than to relate shortly the principal heads of the case of the late Sir Robert Liston, as it has been detailed by Mr Craig of Ratho; and I am indebted to Mr Craig for drawing my attention to a fact which is, I think, unrecognised by the profession generally, viz., that the case of the gentleman of eighty, related by the late Dr Abercrombie in his work on the Intellectual Powers,[1] is neither more nor less than the first series of illusions which Sir Robert Liston had. The whole case has been detailed by Mr Craig in his excellent paper in the Edinburgh Medical and Surgical Journal,[2] and now forms a connected series of the illusions of an old man of considerable mental endowments and great powers as a linguist, and who had spent much of his life abroad in the diplomatic service of his country.

This gentleman, about eighty years of age, of a spare habit of body, and enjoying good health, became liable for nearly twelve years to daily visitations of spectral figures. The head and upper part of body being distinctly defined, the lower parts not so—lost as it were in a kind of cloud. They appeared in different dresses: that of the age of Louis XIV., the costumes of ancient Rome, and that of the modern Turks and Greeks. The countenances of the

[1] Abercrombie on the Intellectual Powers, p. 349.
[2] Edinburgh Medical and Surgical Journal, No. 129.

spectres he cannot recognise, but his own face has occasionally been presented to him. These figures appear in full daylight or in darkness, and he can see them equally well with his eyes open or shut.

On one occasion during the day he had a remarkable illusion. The form of his wife, who had been dead for several years, appeared to him floating around the room, and beckoning him to follow, and ultimately disappeared at the window. The illusion was so distinct, that he followed, and jumped out at the window after it. He only fell some seven and a half feet on the grass lawn; and even the fall failed to dissipate the illusion. These illusions, of constantly-varying form, occurred to this gentleman for upwards of sixteen years. He died at the age of ninety-three.[1]

A gentleman, says Dr Abercrombie, who died some time ago at the age of eighty, for several years before his death never sat down to table at his meals without the impression of sitting down with a large party dressed in the fashion of fifty years back. This gentleman was blind of one eye, and the sight of the other was very imperfect. On this account he wore over it a green shade; and he had often before him the image of his own countenance, as if it were reflected from the inner surface of the shade.[2]

I am indebted to a lady for the following case. A lady of advanced life had long resided in Carlisle in a house on the opposite side of which the daily market for crockery was held, and the practice was for the vendors to lay out their wares to the best advantage, and then surround them for safety with a series of pegs stuck into the ground with ropes between them. This old lady, from her constant observation of this scene for many years, had become so familiar with it that when she changed her house to a different part of the town, and when her illusions first took place, they always assumed the form of the women with the crockery-ware, and with the pins and ropes before them, as they had been familiar to her in the square at Carlisle. This form of illusion continued for long, and at last she became so uncertain of the distinction between illusions and realities, that when individuals entered the drawing-room, she had first to touch them before she would enter into conversation with them.

Another old lady of ninety, with whose case I have been favoured, has one continued illusion of a man and a cat. The man she does not know. He is dressed as usual in the costume of the period. The cat, too, has the same colour and appearance, and always goes through the same series of actions.

[1] The early history of this case exhibits to us the unequivocal illusions of the aged. But the latter part of it has a new element added, that of inflammatory action. I have therefore excluded from consideration all that part of the case in which the active hyperæmic condition is manifested, a condition the existence of which was afterwards exhibited in the discovery of congestion, effusion, and adhesion of the membranes and cavities of the brain.

[2] Abercombie on the Intellectual Powers, p. 351.

Dr J. W. Begbie has favoured me with the history of a case of the illusions of the aged of more than usual interest. I shall describe the illusions of sight and hearing of this lady in Dr Begbie's own words.

"Mrs R., in her ninety-second year, has, through bodily weakness, been strictly confined to bed for some years. Since September 1866 she has been subject to illusions of sight. Frequently she is heard conversing with persons whom she describes as being present with her—sitting at her bed-side. At times she complains of the intrusion of a large black dog, at other times of several cats. These animals she extends her hand to, to feel and stroke. I have on several occasions been with Mrs R., when she has drawn my attention to fancied music, which she describes as very beautiful, and evidently that of a military band. In distinct connexion with the music, she also points to the presence of soldiers—indeed of a whole regiment—marching through the room.

"When reasoned with on the improbability of such visitations disturbing her, and even when directly contradicted, Mrs R., in the most good-humoured manner, asserts her conviction as to the reality of what she has seen and heard.

"On several occasions, when engaged in conversation with persons whom she believes to be present, Mrs R. has been heard to mention the names, and to refer to well-known incidents in the lives of persons long deceased. Mrs R. is now very infirm. Her memory, however, is wonderfully retentive, and she recalls with facility many of the events of her early life. It has been observed that the illusions of sight are less decided when Mrs R. has taken a fair amount of stimulants or enjoyed a good meal,—a circumstance which strongly favours the view, that the aberration in question is intimately connected with deficient or retarded cerebral circulation."

I might quote many similar cases as illustrations of the illusions of the aged; but one recently published by Mr Benjamin Bell, a Fellow of this College, possesses some interesting peculiarities. It was that of a lady considerably beyond eighty, of healthy constitution and vigorous mind, and fascinating in her manners and conversation. Her illusions began by hearing noises like the ringing of bells; then beautiful landscapes appeared on the curtains and walls of her room, with people in motion; then innumerable female heads and busts covering every surface on which she turned her eyes. All the countenances were pleasant—some beautiful. Their costume and mode of arranging the hair were different from what we meet with at the present time. She afterwards saw portraits of men in exquisitely carved frames—especially Dr Chalmers and Professor Miller. These spectra came and went with considerable variation for some time, occasionally representing groups of beautiful grey horses or a crowd of tortoiseshell kittens, and gradually becoming more bearable, although still present in various forms when

Mr Bell described her case. Mr Bell makes the following suggestion, that the illusory perceptions are occasioned by more or less disturbance of the capillary circulation in certain structures intimately connected with sight and hearing, viz., the corpora quadrigemina and the auditory ganglion. But it appears to me more probable that a general want of balance or derangement of the capillary circulation throughout the membranes of the brain, and brain itself, is as likely to cause such phenomena.

In cases in which several senses, and especially that of touch, is affected, this explanation will prove more satisfactory.

3*d*, *Illusions arising from Foreign Substances circulating in the Blood of the Brain.*—Another and common cause of illusions is the pathological condition of the blood in various diseases. We are well acquainted with the fact that the blood in fevers in general, and probably in the early stages of tuberculosis, in diseases of the liver, in uræmic poisoning, etc.,—contains ingredients which, while circulating in the vessels of the brain, are liable to produce illusions of the senses. We know, also, that many foreign ingredients introduced into the circulatory system from without, especially the class of narcotic medicines, is liable to produce similar phenomena.

The outbreak of various malignant fevers has been marked by the appearance of spectral illusions. Dœmerbrock mentions many cases which occurred at the outbreak of the plague at Utrecht and Meiningen. The incipient action of the febrile miasmata of Cadiz and Malaga is, first, to produce a vivified condition of the mind, followed by horrid spectral images, the forerunner of insensibility and death. Morgagni details the case of a scavenger or nightman who, in the course of some of his nocturnal duties in the latrines of Padua, was very much frightened by an apparition; he came home soon afterwards, took fever, and died. Dr Abercombie relates the case of a lady who, on retiring from a party one evening, went into a dark room to lay aside part of her dress. She saw the image of Death as a skeleton, with his hand uplifted, and holding a dart, which struck her on the left side. The same night she was seized with fever, attended with inflammation of the same side; and it is most probable that the sudden attack of pain of the commencing inflammatory attack gave rise to the idea of the blow.[1] The lady recovered. Gout is sometimes ushered in by illusions of the senses. Dr Alderson has related a marked case of this kind. An old lady, of eighty years of age, subject to attacks of this malady, often knew from her general feelings when to expect an attack. She became deaf, and distended in the organs of digestion; she soon was visited by various of her friends, whom she had not invited, and could not hear speak; but when she rang the bell for the purpose of ordering the card-table to amuse them, upon the servant entering, the whole

[1] On the Intellectual Powers, p. 363.

party disappeared. A patient of my own, who is subject to attacks of this kind, has had them repeatedly ushered in by an illusion of a female dressed in widow's attire, about whose affairs she has had much anxiety, and who appears sometimes in bed, sometimes standing at the side of the bed, during the night of the first paroxysm of gout.

There are also many substances which, when absorbed into the blood, produce illusions. The whole class of narcotics and sedatives possess this in a striking degree. I am aware that some contend that no such effects ever follow the primary action of such drugs upon the system; and although I must confess, that with the narcotics and sedatives in common use such phenomena are seldom noticed, still I am satisfied that they are occasionally, nay, not unfrequently to be heard of. A notable example of this, from the use of opium, occurred to the late Dr Gregory. He had gone to the North by sea, to visit a near relative. On returning, he had taken a moderate dose of laudanum, with the view of preventing sea-sickness, and was lying on a couch in the cabin, when the figure of the lady appeared before him in so distinct a manner that her actual presence could not have been more vivid. He was quite awake—fully sensible that it was a phantom produced by the opiate, along with his intense mental feeling, but he was unable by any mental effort to banish the vision.

Another instance by Dr Abererombie also shows this. "A gentleman affected with a painful local disease requiring the use of large opiates, saw in one watchful night a long and regular exhibition of characters connected with certain occurrences which had been the subject of much conversation in Edinburgh before. The characters succeeded each other with all the regularity and vividness of a theatrical exhibition. He heard their conversation; long speeches were occasionally made, some in rhyme, which he distinctly remembered and repeated next day."

An illusion, arising from the primary effects of opium, recently occurred to myself. A married female, for whom I had prescribed repeated small doses of opium for dysentery, told me next day at my visit, that she would take no more opium, as it had produced such visions. Being interested on the subject, I urged her to tell me what she had seen; but she would not do so. Her husband was then present. I repeated my inquiries next day, when her husband was absent, and she then told me that she had been twice married, and that she had no sooner taken the first dose of opium than the spectre of her former dead husband stood before her, and stared at her from the bottom of the bed, and that the distinctness of the illusion was increased with every dose of opium. A young lady, at present under treatment, had, but a few days ago, a curious illusion from the primary effects of this drug. She took a small dose of opium in the forenoon, and lay in bed quiet, but did

not sleep. A short time afterwards she requested her mother, who was sitting by her bedside, to remove the large book with the beautiful gilding, which lay upon the bed, and was too heavy. This was an illusion from the opium, and of two senses, both sight and feeling.

One of the most striking cases of illusions arising from the circulation of some constituent of the bile in the blood, has recently occurred to me. This young lady labours under *abscess of the liver*, and has been now five months and a half suffering from it. Within the last three weeks her illusions of sight, hearing, and touch have become more numerous, more varied, and more continuous than I have ever seen them. She has been frequently seen during the course of her illness by Sir James Simpson. These illusions occur by night and by day, in the brightness of sunshine and darkness of the night. They consist principally of relatives and friends who have come to visit her. They are all the representatives of individuals who are alive, but many of their names her relatives cannot recognise. They are male and female. She addresses them all by name, and holds conversations with them. Sometimes they sit at her bed-side; sometimes they lie in the back of the bed, where she is; and the continued succession of them, whoever is present, is truly curious. Sometimes she supposes she has money in her hand, shows it to those around her, and is afraid she loses it. On one occasion she insisted that I should arrange some photographic apparatus that stood on a table in her bed-room, and with which she proposed to take the photograph of a young clergyman in whom she was interested. At a usual forenoon call, I found her in a great state of excitement, in consequence of a visit from a deacon of the Free Church, whom she named, and who she knew was actively engaged at the time in collecting subscriptions for his church. She told me that he had come in in the absence of her mother, and had talked and urged her until she was quite tired; that she told him she could not afford to give him so much money as he wanted, but that he would not be satisfied with less; that she then cried bitterly, and told her sister, who came, about it, and was astonished that she did not see him sitting, or hear him speaking. The illusions of this young lady have now entirely ceased; and even while they lasted, she was quite rational on every other point.

Narcotic potions, ointments, and inhalations were much used by the ancients, and especially in the temples, where apparitions of the dead or the living were expected. They no doubt acted as we have just described the primary effects of opium in certain constitutions. Buchanan, the Scottish historian, states, that the victory of Macbeth over the Danes was obtained by mixing the juice of the Atropa belladonna with wine, which was sent to Sweno during a truce. Herodotus informs us that the Scythians were intoxicated by inhaling the vapour of a species of hemp, probably the Cannabis

indica; for the effect of this drug in causing apparitions from primary intoxication is notorious. Some of the species of Datura, or thorn-apple, are also much used in semi-civilized countries for such purposes, and used to be employed by the ancients in their potions, unguents, and inhalations. The Datura sanguinea is mentioned by Dr Tschudi, in his travels in Peru, as in use among the natives for making a drink called Tonga. The natives believe that by drinking this *tonga*, they are brought into communication with the spirits of their forefathers. But here, as in all these narrations, it is impossible to distinguish the proper illusions of the senses, from the numerous dreams of disturbed sleep, which are the most common result of the action of such substances. We shall not linger on this department, but hasten to make a few closing remarks. The scope of the subject we have been considering may be summed up in a few concluding sentences.

1*st*, That illusions of the senses have their origin in certain derangements of the brain connected with sensation and perception.

2*d*, That the pathology of illusions consists of two different states of the membranes and brain itself — that of congestion, and that of diminished supply of blood. The latter being by far the most common, as in those from advanced age.

3*d*, That illusions of the senses are also liable to arise from morbid substances in the blood itself, or the absorption into it of foreign ingredients.

4*th*, That in persons of sane mind and common intelligence, illusions of the senses can be, and are generally detected as such, by the reason, and by various tests which the reason supplies,—differing thus from the delusions of insanity, which are believed by the individual to be real.

5*th*, That images of sudden and vivid mental origin, or objects about which the mind has become over-excited, are liable to present themselves to the different organs of sense in the form of illusions.

6*th*, That all superstitions are traceable to the highest and profoundest intuitions of man's nature; and that these intuitions, directed by the reason, are the source of the belief in the existence of a deity, and the immortality of the soul: thus originating, at once, a knowledge of two of the deepest truths connected with our immortal being; and at the same time, when unguided by reason, assuming superstitious forms in harmony with the nature of the country and the mental idiosynerasies of its people.

7*th*, That witchcraft resolves itself into illusions of the senses, under deep excitement or superstitious dread; and that, like insanity, it prevents the reason from distinguishing between the real and the illusory.

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